Bureau of Reclamation
Upper Colorado Region

# Operation of Flaming Gorge Dam Environmental Impact Statement Newsletter

November 2001

## Flaming Gorge Operations Environmental Impact Statement

The Bureau of Reclamation is preparing an Environmental Impact Statement (EIS) on the operation of Flaming Gorge Dam. Flaming Gorge Dam is located on the Green River in northeastern Utah.

The EIS will analyze the effects of complying with Section 7 of the Endangered Species Act by implementing flows recommended by the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (*Recovery Program*) to benefit existing populations and designated critical habitat of the four Colorado River endangered fishes. These fish species include the razorback sucker Colorado pikeminnow, humpback chub, and bonytail.

**A Cooperative Effort**

**Lead agency:**
Bureau of Reclamation

**Cooperating agencies:**
Bureau of Indian Affairs
Bureau of Land Management
National Park Service
U.S. Fish and Wildlife Service
U.S. Forest Service
Western Area Power Administration
State of Utah
Utah Associated Municipal

### Background

In 1979, Reclamation began releases from the dam to support endangered fish research studies. In 1980, formal consulta-tions began with the U.S. Fish and Wildlife Service (Service) under the Endangered Species Act. However, information on habitat requirements for the endangered fishes was unavail-able, and issuance of a final biological opinion was delayed until completion of data collection and studies for use in developing specific flow recommendations in the Green River downstream from the dam.

Dam operations were initially evaluated for potential effects on endangered fishes during a 5-year period from 1979 to 1984. Releases from the dam were modified from 1985 to 1991 to benefit the endangered fishes and to evaluate test flows in the Green River.

### Recovery Program

The *Recovery Program* was initiated in 1987, and the *Recovery Program* team is composed of members from the states of Colorado, Wyoming, and Utah; the National Park Service, Reclamation, the Service, and the Western Area Power Administration; the Colorado River Energy Distributors Association; and environmental and water user organizations.

The goals of the *Recovery Program* are to protect and recover the endangered fish species of the Upper Colorado River Basin so that they no longer need protection by the Endangered Species Act, while the Upper Basin States continue to develop their 1922 Colordo River Compact entitlements.

Following review of the over 20 years of data collection, studies, and research, this group prepared the Recovery Implementation Program Recovery Action Plan (*Recovery Action Plan*) which contains the elements determined to be essential for the recovery of the endangered fishes.

Information on the Upper Colorado River Endangered Fish *Recovery Program* is available at the following internet address: http://www.r6.fws.gov/coloradoriver/. You may also contact Debbie Felker at the U.S. Fish and Wildlife Service, 303-969-7322, Ext. 227, e-mail: debbie_felker@fws.gov.

### The EIS—Proposed Action, Purpose, and Scope

The ***proposed action*** of the EIS is to operate Flaming Gorge Dam to achieve the flows recommended by the Recovery Program while continuing the

*See **EIS**, Page 2*

***Inside This Issue***

*From the desk of Beverley Heffernan*

*National Environmental Policy Act (NEPA) Manager, Flaming Gorge EIS*

***This newsletter is being sent to all those who participated in the scoping process for the Flaming Gorge EIS as well as those who asked to be kept informed of our progress in preparing the EIS. We are now in the process of identifying and analyzing potential impacts and writing the draft EIS. We hope to have the draft available for public review in June 2002. In the meantime, if you have any questions about the Flaming Gorge EIS, please call me at 801-379-1161 or e-mail: bheffernan@uc.usbr.gov. If you have internet access, you may also wish to visit the Flaming Gorge EIS website (www.uc.usbr.gov, click on "Environmental Programs" then click on "Flaming Gorge EIS").***

***EIS*** *- continued from Page 1*

other authorized purposes of the Flaming Gorge Unit of the Colorado River Storage Project. The EIS will assess impacts to the reservoir and downstream resources as a result of operating the dam to implement the recommended flows.

The ***purpose*** **of the proposed action** is to protect and assist in the recovery of the populations and designated critical habitat of the four endangered fishes in the Green and Colorado River Basins, so that along with the other activities contained in the Recovery Action Plan, the fishes no longer require protection under the Endangered Species Act.

The ***scope*** of the analysis for this EIS will focus on responding to the following analysis question:

> If Reclamation operates Flaming Gorge Dam to achieve the flow recommendations needed to protect and assist in the recovery of the endangered fishes and their critical habitat in the Green River, then the effect(s) on other relevant resources/issues, both upstream and downstream from the dam, would be ...

The focus of the EIS is to identify and describe the most likely impacts to all resources as a result of implementing the flow recommendations for endangered fish, while continuing the other authorized purposes of the Flaming Gorge Unit. Following initial meetings among the researchers and cooperating agencies, Reclamation began the scoping process in June 2000.

## The EIS Process - Scoping

The first step in an EIS process is known as scoping. Scoping is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues to be analyzed in depth relating to a proposed action.

Scoping is an ongoing process meant to provide the lead and cooperating agencies with the biological and sociological parameters needed to understand the overall impacts to the human environment from implementation of the proposed action. The biological and sociological analyses are intended to be sufficient for Reclamation to make an informed decision on how best to implement the proposed action with the least overall adverse impacts to the resources of concern.

**Public scoping** for the EIS began in June 2000 and concluded in September. However, comments pertinent to the scope and significance of issues to be addressed are accepted at any time during the EIS process.

*See* ***Scoping****, Page 3*

***Scoping*** *- Continued from Page 2*

Comments from scoping are being used to:

- Identify issues associated with the proposed action and its purpose and need
- Identify other significant resources that may be affected
- Identify the interested party or parties affected by the proposed action
- Assist with the development of reasonable alternatives consistent with the intent of the flow recommendation
- Identify and de-emphasize insignificant issues
- Assist with determining a reasonable geographic scope of the EIS (how far upstream/downstream from the dam impacts can be meaningfully evaluated)

## Scoping Results

Following conclusion of the formal public scoping period, Reclamation evaluated the cards, letters, e-mails, and comments submitted at the public scoping meetings. Over 2,000 written responses were received, and nearly 200 people participated in the five public meetings held in mid-July in Salt Lake City, Vernal, Fort Duchesne, Rock Springs, and Grand Junction. Many of those who commented at the scoping meetings also sent in written comments.

Based on the scoping results and existing laws and regulations, the EIS will contain an analysis of the following issues and resources of concern:

- Aquatic resources
- Biodiversity
- Cultural resources
- Disease vectors (mosquitoes)
- EIS process (proposed action, purpose and need, scope, alternatives)
- Environmental justice
- Facilities (dam and powerplant operations and maintenance, dam safety)
- Indian trust assets
- Recreational user fees
- Riparian/wetlands
- Fish and wildlife (other than endangered species)
- Land use (agriculture, national parks)
- Power generation and marketing
- Reservoir limnology
- River and reservoir fisheries
- River and reservoir recreation
- Setting (geology, climate)
- Socio-economics (tourism-related jobs, income)
- Threatened and endangered species
- Water (conservation, drought, flood control, river flows, water quality, water rights, water safety, water supply, water temperature, and water use)

The Operation of Flaming Gorge Dam EIS will also include a discussion of the following topics:

- Direct and indirect impacts
- Cumulative impacts
- Unavoidable adverse impacts
- Impacts on other Federal and non-Federal projects and plans
- Alternatives to the proposed action
- Alternatives considered but eliminated from further study
- Mitigation measures/environmental commitments
- Relationship between short-term uses and long-term productivity
- Irreversible and irretrievable commitments of resources
- Adaptive management

The form letters and e-mail messages primarily supported implementation of the flow recommendations for endangered fish in the Green River, with many calling for an evaluation of decommissioning the dam. The signed petitions supported the existing reservoir and river recreation uses, including the trout fishery. The comment letters received reflected the spectrum of both of these concerns, but in more detail.

*See* ***Scoping****, Page 7*

# Recommended Flows

The goal of the recommended flows is to improve the habitat and enhance the populations of the endangered fishes by providing annual and seasonal patterns of flows and temperatures in the Green River below Flaming Gorge Dam.

The table on the opposite page summarizes the flow recommendations contained in the July 2000 *Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam.* The table contains recommendations for three reaches of the Green River for the spring runoff and summer-to-winter base flow periods under a variety of hydrological conditions, including:

- The recommended flows for the entire Green River below the dam which are increasingly influenced by other tributaries such as the Yampa, White, and Duchesne Rivers as you move downstream.
- A wide range of hydrologic conditions occurring in the Green River Basin—from drought to flood.
- Flows for different seasons of the year, from spring runoff to summer, fall, and winter flows.

The recommended flows are adjusted for each of the three reaches and seasons (spring runoff and base flow), depending on projections of how ***wet*** or ***dry*** the season is expected to be (hydrologic condition) in a given year. Hydrologic conditions are defined using *exceedance intervals*–or how often a forecasted runoff is expected to exceed a certain volume.

For example, a 0-10% exceedance year would be a year in which the forecasted volume of runoff flows would be expected to be higher only 0-10% of the time, or a very ***wet*** year. In contrast, in a 90-100% exceedance year, the forecasted runoff is expected to be higher 90-100% of the time, or a very ***dry*** year. Either ***wet*** or ***dry*** years could be expected to occur 10% of the time, or 1 in every 10 years. ***Average*** years (30-70% exceedance) would be expected to occur 40% of the time, or 4 out of 10 years. Simply put, exceedance intervals are used to depict wet or dry conditions expected in a given year.

For example, if the snowpack is relatively high and the forecasted runoff is expected to be in the ***moderately wet*** category (10-30% exceedance), which will happen on an average of 2 out of every 10 years, this is considered a ***moderately wet*** runoff year. The flow recommendations suggest that peak flows in Reach 1 (Flaming Gorge Dam to the Yampa River) be greater than or equal to 4,600 cubic feet per second (cfs), while base flow during late summer, fall, and winter would be between 1,500 and 2,500 cfs. Peak flows in Reach 2 (from the Yampa River to the White River) should reach peaks of greater than or equal to 20,300 cfs and be maintained, if possible, at 18,600 cfs for at least 2 weeks. The base flow in the reach could vary between 2,400 and 2,800 cfs. Finally, in Reach 3 during this ***moderately wet*** year, peak flows should be greater than or equal to 24,000 cfs and be maintained at a level of 22,000 cfs or greater for at least 2 weeks. Recommended base flow for Reach 3 during a ***moderately wet*** year should range between approximately 2,700 and 4,700 cfs.

In summary, during a ***moderately wet*** year, releases from Flaming Gorge Dam would be 4,600 cfs or greater for at least 2 weeks in duration to supplement inflows from the downstream tributaries to flows in Reaches 2 and 3 of the Green River in order to meet the target ranges specified for those reaches.

In contrast, during a ***dry*** year (90-100% exceedance) which would occur 1 in 10 years on average, peak flows in Reach 1 would be similar (4,600 cfs) but of a much shorter duration than the ***moderately wet*** year and the recommended base flow would be lower. In Reach 2, recommended peak flows and the duration of peak flows would be lower and shorter than during a moderately ***wet*** year (8,300 cfs for 2 days versus a peak of 20,300 cfs with at least 2 weeks above 18,600 cfs). The base flow would be lower (900-1,100 cfs versus 2,400-2,800 cfs). Recommended flows for Reach 3 would be similarly reduced under dry conditions. Put another way, minimum releases from Flaming Gorge Dam in a very dry year would be approximately 4,600 cfs for at least 2 days compared to a minimum release of 4,600 cfs or greater for at least 2 weeks in moderately wet years.

The flow and temperature recommendations also cover levels of day-to-day changes in water elevations on the Green River at Jensen, Utah, due to hydropower fluctuations; variations in the base flow during the summer, fall, and winter; and temperature recommendations during the summer.

The detailed flow and temperature recommendations are available on the internet at: www.us.usbr.gov. Select Environmental Programs, then select Flaming Gorge EIS, then Flow Recommendations.

## Recommended Magnitudes and Duration of Maximum Spring Peak and Summer-to-Winter Base Flows for Endangered Fishes in the Green River Downstream from Flaming Gorge Dam

| GREEN RIVER REACH | FLOW PERIOD | HYDROLOGIC CONDITIONS AND FLOW RECOMMENDATIONS[A] | | | | |
|---|---|---|---|---|---|---|
| | | **WET**[B] (0 – 10% exceedance) | **MODERATELY WET**[C] (10 – 30% exceedance) | **AVERAGE**[D] (30 – 70% exceedance) | **MODERATELY DRY**[E] (70 – 90% exceedance) | **DRY**[F] (90 – 100% exceedance) |
| **Reach 1** Flaming Gorge Dam to Yampa River | **Maximum Spring Peak Flow** | **≥8,600 cfs** (244 $m^3/s$) | **≥4,600 cfs** (130 $m^3/s$) | **≥4,600 cfs** (130 $m^3/s$) | **≥4,600 cfs** (130 $m^3/s$) | **≥4,600 cfs** (130 $m^3/s$) |
| | Peak flow duration is dependent upon the amount of unregulated inflows into the Green River and the flows needed to achieve the recommended flows in Reaches 2 and 3. | | | | | |
| | **Summer-to-Winter Base Flow** | **1,800-2,700 cfs** (50-60 $m^3/s$) | **1,500-2,600 cfs** (42-72 $m^3/s$) | **800-2,200 cfs** (23-62 $m^3/s$) | **800-1,300 cfs** (23-37 $m^3/s$) | **800-1,000 cfs** (23-28 $m^3/s$) |
| **Reach 2** Yampa River to White River | **Maximum Spring Peak Flow** | **≥26,400 cfs** (748 $m^3/s$) | **≥20,300 cfs** (575 $m^3/s$) | **≥18,600 cfs**[G] (527 $m^3/s$) **≥8,300 cfs**[H] (235 $m^3/s$) | **≥8,300 cfs** (235 $m^3/s$) | **≥8,300 cfs** (235 $m^3/s$) |
| | **Peak Flow Duration** | Flows greater than 22,700 cfs (643 $m^3/s$) should be maintained for 2 weeks or more, and flows ≥18,600 (527 $m^3/s$) for 4 weeks or more. | Flows greater than 18,600 cfs (527 $m^3/s$) should be maintained for 2 weeks or more. | Flows greater than 18,600 cfs (527 $m^3/s$) should be maintained for at least 2 weeks in at least 1 of 4 average years. | Flows greater than 8,300 cfs (235 $m^3/s$) should be maintained for at least 1 week. | Flows greater than 8,300 cfs (235 $m^3/s$) should be maintained for 2 days or more except in extremely dry years (≥98% exceedance). |
| | **Summer-to-Winter Base Flow** | **2,800-3,000 cfs** (79-85 $m^3/s$) | **2,400-2,800 cfs** (69-79 $m^3/s$) | **1,500-2,400 cfs** (43-67 $m^3/s$) | **1,100-1,500 cfs** (31-43 $m^3/s$) | **900-1,100 cfs** (26-31 $m^3/s$) |
| **Reach 3** White River to Colorado River | **Maximum Spring Peak Flow** | **≥39,000 cfs** (1,104 $m^3/s$) | **≥24,000 cfs** (680 $m^3/s$) | **≥22,000 cfs**[I] (623 $m^3/s$) | **≥8,300 cfs** (235 $m^3/s$) | **≥8,300 cfs** (235 $m^3/s$) |
| | **Peak Flow Duration** | Flows greater than 24,000 cfs (680 $m^3/s$) should be maintained for 2 weeks or more, and flows greater than 22,000 cfs (623 $m^3/s$) for 4 weeks or more. | Flows greater than 22,000 cfs (623 $m^3/s$) should be maintained for 2 weeks or more. | Flows greater than 22,000 cfs (623 $m^3/s$) should be maintained for 2 weeks or more in at least 1 of 4 average years. | Flows greater than 8,300 cfs (235 $m^3/s$) should be maintained for at least 1 week. | Flows greater than 8,300 cfs (235 $m^3/s$) should be maintained for 2 days or more except in extremely dry years (≥98% exceedance). |
| | **Summer-to-Winter Base Flow** | **3,200-4,700 cfs** (92-133 $m^3/s$) | **2,700-4,700 cfs** (76-133 $m^3/s$) | **1,800-4,200 cfs** (52-119 $m^3/s$) | **1,500-3,400 cfs** (42-95 $m^3/s$) | **1,300-2,600 cfs** (32-72 $m^3/s$) |

**A** - Recommended flows as measured at the United States Geological Survey gauge located near Greendale, Utah, for Reach 1; Jensen, Utah, for Reach 2; and Green River, Utah, for Reach 3.

**B - Wet** (0 - 10% exceedance): A year in which the forecasted runoff volume is larger than almost all of the historic runoff volumes. This hydrologic condition has a 10% probability of occurrence.

**C - Moderately Wet** (10 - 30% exceedance): A year in which the forecasted runoff volume is larger than most of the historic runoff volumes. This hydrologic condition has a 20% probability of occurrence.

**D - Average** (30 - 70% exceedance): A year in which the forecasted runoff volume is larger than about one-half of the historic runoff volumes. This hydrologic condition has a 40% probability of occurrence.

**E - Moderately Dry** (70 - 90% exceedance): A year in which the forecasted runoff volume is less than most of the historic runoff volume. This hydrologic condition has a 20% probability of occurrence.

**F - Dry** (90 - 100% exceedance): A year in which the forecasted runoff volume is less than almost all of the historic runoff volumes. This hydrologic condition has a 10% probability of occurrence.

**G -** Recommended flows ≥18,600 cfs (527 $m^3/s$) in 1 of 2 average years.

**H -** Recommended flows ≥ 8,300 cfs (235 $m^3/s$) in other average years.

**I -** Recommended flows ≥ 22,000 cfs (623 $m^3/s$) in 1 of 2 average years.

$M^3/s$ = cubic meters per second

# The Endangered Fish

The Green River downstream of Flaming Gorge Dam is home to the largest known river populations of the endangered Colorado pikeminnow and razorback sucker found anywhere in the world. This section of river also supports important populations of humpback chub and contains critical habitat for the extremely rare bonytail which has recently been stocked in the Green and Yampa Rivers to supplement populations of that species.

**Colorado pikeminnow**. Called white salmon and Colorado salmon by early settlers, these fish were once abundant in the Colorado River and most of its tributaries. It is believed that these fish at one time lived 50 or more years, grew 38 inches long, and weighed up to 25 pounds.

The Green River below Flaming Gorge Dam, and particularly downstream of the largely free-flowing Yampa River, is important for endangered species because of its relatively unregulated nature and the fact that important habitats still occur there.

Flow recommendations for the Green River largely depend on using releases from Flaming Gorge Dam to supplement flows in the Yampa River to mimic a more natural flow regime below the confluence of the rivers.

Under the Endangered Species Act, designated critical habitat for these fish species includes the Green River from its confluence with the Yampa River downstream to Lake Powell below the Colorado River confluence.

Although the Green River above the Yampa River has not been designated as critical habitat, this section of river is also inhabited by Colorado pikeminnow and razorback sucker. Recent research has shown that the Colorado pikeminnow is seasonally abundant in the Green River in Lodore Canyon and may occur as far upstream as Brown's Park on the Green River.

The Colorado pikeminnow, razorback sucker, humpback chub, and bonytail are unique to the Green and Colorado River systems. These fishes are adapted to a natural flow regime that consisted of a system of fluctuating seasonal and annual flows influenced by wet, average, and dry climatic periods that occurred prior to the construction of large-scale water projects.

However, the very traits that made them so successful in a historically variable environment have contributed to their decline in the more stable and regulated river environment that now occurs in much of the Colorado River system. The altered habitats that occur as a result of dam construction are often more suitable for introduced, non-native fishes, some of which have flourished and now compete with and prey on the native species of the Colorado River Basin.

The operation of Flaming Gorge Dam is closely linked to recovery efforts for the endangered fishes in the Green River and is a critical element of the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (*Recovery Program*). The link between the *Recovery Program* and Flaming Gorge Dam is important because the *Recovery Program* has a dual mission—that of recovering the endangered fish species while also allowing for future water development for human use.

The *Recovery Program* is one of the oldest basinwide recovery efforts and exemplifies successful cooperation among diverse stakeholders to recover endangered species while allowing the states to develop their Colorado River Compact entitlements. Since its inception in 1988, the *Recovery Program* has allowed the Bureau of Reclamation and other agencies to successfully complete Endangered Species Act compliance on some 600 water projects covering 618,000 acre-feet of new water development in Utah, Wyoming, and Colorado.

**Razorback sucker**. Known to live 40 years or more and grow up to 3 feet long and 30 pounds, these fish once thrived in the Colorado River Basin from Wyoming to Mexico but are now on the endangered species list.

The program provides for collaborative problem solving and proactive efforts that reduce costly litigation and, due to its success, has served as a model for other similar programs in the West.

***Scoping*** *- Continued from Page 3*

## Where Do We Go From Here?

Information gleaned from the scoping comments was provided to the EIS team resource specialists. Each comment is being considered as to applicability and relevance to the proposed action, the purpose and need of the proposed action, and the extent to which the comment contributes to a reasonable decision. Reclamation resource specialists, working with staff specialists from the cooperating agencies and other interested parties, will prepare the draft EIS and forward it to all interested parties for review and comment. The schedule shown below notes activities completed to date as well as those leading to completion of the final EIS and Record of Decision. The public is invited to actively participate in this process.

### FLAMING GORGE EIS SCHEDULE
### Begin EIS June 6, 2000 (Publish Notice of Intent)
### Complete EIS March 2003 (Record of Decision)

| Task/Activity | Estimated Date |
|---|---|
| Publish *Notice of Intent* to prepare draft EIS in *Federal Register* | June 6, 2000 |
| Conduct scoping meetings | July 2000 |
| Complete public scoping process | September 2000 |
| Publish draft EIS | June 2002 |
| Public review of draft EIS | June - August 2002 |
| Public hearings | July - August 2002 |
| Publish final EIS | March 2003 |
| Record of Decision | April 2003 |